

The History of Hebburn's Tharsis Sulphur & Copper Company 1923 period

A source of employment was the extracting of copper from burnt pyrites at the works of the Tharsis Sulphur & Copper Company in which were engaged over 450 men. These works were established about 1869, and the system adapted for the extracting of the copper was extremely interesting, as showing the economy of applied science. These pyrites came originally from the Tharsis mines in the south of Spain direct to the chemical manufacturer who burnt off the sulphur for the making of sulphuric acid. Over 1000 tons of burnt pyrites was treated weekly at these works, from which was extracted large quantities of copper leaving a residue of nearly the original weight (1000 tons). This residue was still valuable for it contained 56% of metallic iron and was sent to the ironworks in this and the Middlesbrough district. Besides extracting and refining this class of copper they smelted and refined large quantities of copper precipitate obtained at the mines from both the above sources. Between 5000 and 6000 tons of copper was produced per annum and it was chiefly exported to the continent in the shape of cakes and ingots. The Tharsis mines in Spain belonged to the Company who had works at Willington on Tyne, Glasgow, Oldbury, Widnes & Cardiff with a total output of nearly 12000 tons yearly.

Now the pyrites, known by the workmen as copper ore, were brought up to the bank top in wagons similar to the wagons used in coalmines, usually known as black wagons with an approximate load of 2 tons. There were large sheds at the bank top under which were the bunkers, and the rails passed over the bunkers so that wagons could discharge their load between the rails into the bunker. Young men aged between 16 to 25 yrs old were employed as trimmers in these bunkers at a wage of £1-9-2 a week. Their job was to trim the ore onto the conveyor belts. These young men had to use safety belts as the ore used to move away from the top, so without a belt the trimmers were in constant danger of being buried alive. This did happen to a young man by the name of Hallam who lived in Hebburn. It so happened that he had no safety belt on and unfortunately the ore started to move and he was completely buried. You see, these belts had a length of strong rope or chain attached, and the other end was fixed to a high point in the bunker. Mr Stewart the Under-Manager was in the area at the time and as soon as he was informed of the accident he immediately rushed down below & opened the shutter to allow the ore to come through, but as the young man came through he was found to be dead.

Now as the ore was being trimmed it was carried away on conveyor belts to the Mills where it was crushed. There it was transferred to the furnaces of the Retort type where the Sulphur was burnt off. These furnaces had a steel shaft going right through the top centre & into the furnace. There were strong steel scrapers attached to the shaft which revolved

inside the furnaces & continually moved the ore around. While in the process of having the Sulphur burnt off these furnaces were heated by gas which was made by their own gas producer situated near the furnaces. It was worked by three men on an eight hour shift.

Now the next part of the process was discharging it from the base of the furnace into iron bogeys running on a small gauge set of rails alongside the furnaces. This part of the process required strong men as it was not only very heavy but also very hot especially when opening the chute. The burnt ore was often red hot as it entered the bogeys which were of the tip up type. The base of the bogey was of a most strong iron or steel and the container was of iron. Now this part of the factory was known as the Calcining House and the men were known as 'tank casters', and this part of the works covered a large area.

The workmen wore clogs, and I may add that they could wear a pair out in less than two weeks as sulphuric acid was used in the process. The men always had a towel round their necks, which was often used as a gag when there was gas in the air. While discharging the furnaces in the building there were many rows of tanks with a small gauge set of rails running between each row. The ore was tipped into the tanks the sulphuric acid was run into them from two Towers approximately 150 ft high. The acid was run down through long wooden channels and into the Calcining House tanks that had the burnt ore in them. I believe they were left for several days then the dilute acid was run off. Then the tank casters went in & cast the contents out of the tanks into what were called 'Side wagons' which had a side that could be let down for discharging. At the top of the bank, which was close to the two Towers known as Condensers was the Engine House where there was an electric power driven winding motor used to haul the wagons up to the bank top. Now at this point was a wooden structure about 20 ft high known as 'the gears'. It was actually a flyover which led into the brick yard which I may add was the next part of the process. Now often the men who were at the top of the gears took the endless rope hook of the wagons and pushed them along the gears into the brickyard. This is where the wagon discharged its load into the Pug Mill which was also well above ground level. Cart men were sub-contracted out from Mr Ben Towell who at this time owned the Red House Farm. Their work was to bring loads of common clay from outside the works and this was mixed in with the 'Blue Billy' that it was known as after it was processed in the Calcining house.

Now before I deal with the Brickyard, I will explain the purpose of the Condensers that I mentioned earlier. They were approx 150 ft high and about 8 to 10 feet square. There were two in number built of firebrick and reinforced with broad metal or iron bands which overlapped the sides of the Condensers. Long steel rods went through the ends of the bands with large lock nuts holding them together, and the whole structure was covered with pitch. Large pipes about 2ft in diameter entered the sides of the Condensers at the base. These pipes came up through the ground from a deep flue 6 to 7 feet deep which led up from the Calcining House. The gas from the retort furnaces was forced up this flue by a

large extractor fan into the Condensers, the interior of which was completely loaded with hard coke. Now on the top of each condenser was a large tank about 4ft in depth, although from the top edge of the tank to about 4ft down was a large steel or iron plate reaching right across. It was perforated with holes just inches apart with small tubes coming up through the plate to about 2 inches high. Each of them had a small porcelain cover which allowed water to go down and into the Condensers, at the same time preventing the gas from coming up through the top. Now this part of the plant was used in the production of sulphuric acid. Let us now turn to the Brickyard.

As I mentioned before, common clay was mixed with the Blue Billy and brought to the consistency of well mixed cement. This was then discharged into a lower chamber or cavity and down below, underneath was a chute with a movable slide to let the blue billy be discharged into the barrows. Now four men were employed who were known as 'wet barrow men' and they worked on a piece rate. Now these barrows were large and lined out with thin sheet iron and the front part was shaped like a council workman's dumper and they could hold several hundredweight. One might be excused for thinking that its contents would be very heavy on the shaft of the barrow which had only one wheel but this was right under the centre and took the weight off the handles. It was then a matter of balance. There were four brick flats which were fairly large with narrow flues just below the surface, and the fire box was below the surface by about 3 ft. The barrow men used moulds which were similar to a bees honeycomb but on a larger scale in which moulded bricks about 12 inches by 7 inches were made. These were left on the flats for several days until they were dry enough for lifting and this is where the barrow men took over. The barrows that they used were similar to the old fashioned porter's barrow. Their job was to put the bricks into the kilns which were then sealed in and fired for two or three days, when another squad of men were employed to discharge them. Now this work was very hot and hard, and hand rags had to be used as the bricks were very brittle and hot. The men used a builders type of barrow which they had to push up a gangway and tip their load into NCR trucks which then transported them to the Steel Works in this and other Districts. Before I deal with the next part of the process it is necessary to mention that several sets of railway lines led into the works from the North Eastern Railway to bring wagons with large quantities of coal, firebricks, cement and many other materials including scrap iron and drillings from shipyards. Even rag & bone men used to bring scrap iron in, also old pots and pans, empty milk tins, even large paint drums etc. I have seen the ragmen empty water out of the very large drums after being weighed on the scales and paid for as well. The railway lines branched off to the various directions at the top part of the factory. Now I will deal with the Precipit House, where large quantities of precipitate was manufactured. The process was as follows.

Young men or boys were employed in this department wheeling scrap iron from small open pits close by into the Precipit House. Here rows of tanks or some might call them vats, and in between each row there was a gangway about three planks wide almost level with the top of the tanks, along which were steel or metal pipes about 4 to 5 inches in diameter. Now these steam pipes were of high pressure brought up from the boiler house. There were also heavy wooden gutters or channels in which flowed sulphuric acid and when these tanks were loaded with scrap they were topped up with sulphuric acid run in from the channels. Now at each tank the steam pipe was at about the same level as the gangway and at each short branch off the main steam pipe led in over the edge, reaching just above the level of the acid. When the valve was opened a powerful jet of steam was forced into the acid and its contents. This went on for some considerable time until the contents of the tank were dissolved into a slimy substance that is precipit. Then any acid in the tank was run off. Then the tank cart would get in and shovel the precipit out. This is where the young men were brought in. The tank easter filled their barrows with precipit and they took it along to where there was a large perforated iron plate which was used as a riddle as there was always a certain amount of scrap left in. The young men then tipped their barrow load of precipit onto the riddle while another man with a hose pipe coupled upto a water pipe used to wash the precipit through into a pit, and when it was full one of the men would rake off the scrap. Then they lifted the plate to one side and proceeded to load their barrows. It was then taken a few yards and tipped over the side of the refinery, this being on a lower level by about eight to ten feet.

And now let us turn our attention to the Refinery, which although not very wide was certainly a long building. There were 14 or 15 furnaces in this building for refining, but I may add that they were never all used at the same time as some would be under repair. Brick layers were often called in to repair the flue of the furnaces as the intense heat would burn the brickwork until it was wafer thin.

Now the precipit that was tipped into the refinery was put into the furnaces along with other scrap copper, usually in the form of pigs, and charged through the side of the furnace. When the furnace was ready for tapping, this took place at the front end where there was a bed of sand spread out so that when the furnace was tapped the molten mass was formed into pigs. When they were set and cooled some of them were taken along to the north east end of the refinery where they put them into a cupola. The reason being there was a lot of slag in them which had to be smelted down again. The cupola was just like a factory chimney and round in structure. Now the furnace door was almost on a level with the refinery floor, but under the floor was a fairly large cavity where the furnace men worked. This was at the base of the furnace, and when the contents were ready for tapping it was run into a large bed of sand. After it was set and cooled out it was then taken up to the four furnaces at the other end of the refinery for a final charge, but by this

time most of the impurities were eliminated. Now these last four furnaces were slightly different from the rest as far as the tapping of them was concerned. Instead of tapping a hole there was a hole in front of the furnace approx 18 inches square and when the furnace had been fully charged a quarrel was placed over the opening of the front of the furnace, and I think there was an iron bar placed in front to keep it in position. About four yards in front of the furnaces there were two or three steel or iron troughs about five or six feet long and three feet wide, with a steel shaft fixed from one end of the trough to the other end at the top edge. On this shaft there were ten or twelve steel moulds which could be tipped over. Now these four furnaces were deeper than the other ones, the reason being that the molten copper had to be ladled out. There were hand ladles about four feet long with a bowl large enough to hold enough molten copper to fill two moulds, and I may say that the copper at this stage was absolutely pure. This work was very hot and I have watched these furnacemen on numerous occasions while I was working with the bricklayers. Six refining furnace men were employed on these four furnaces, and I believe they were the top wage earners. A labourer was employed who worked with these men by the name of William Lloyd, and his work entailed tipping the ingots out of the moulds when cooled off. Then with a pair of tongs would lift the ingot out of the trough into the barrow, which he wheeled about 20 yards to where there was a chute at a steep angle, shouting all the way 'am here, am here am here'. The reason being that the men down below were collecting the ingots and wheeling them across a covered bridge which led over the riverside road. Then they were lowered to the ground which was the same level as the Jetty and I believe this was where they were held in storage, and as required they were hauled up to the bank top for dispatch to the Continent.

George Falconer.